Attachment G. **Calculation Equations:**

1. Human equivalent methyl bromide concentration:

$$ppm\ (human)\ =\ ppm\ (animal) \times \frac{animal\ \ respiration\ \ rate}{human\ \ respiration\ \ rate} \times \frac{hours\ \ exposed}{24\ \ hrs} \times \frac{days\ \ exposed\ \ per\ \ week}{7\ \ days}$$

The term for number of days exposed per week/7 days is used in the calculation only for studies when the animals were dosed for 5 or more days. The dose was not corrected for absorption (absorption factor, AF) since the absorption rates of methyl bromide in humans (52-55%) were similar to those for experimental animals, beagle dogs 40%, and rats 27% to 48%.

The default respiration rates used are: 0.46 m^3/kg/day for children, 0.26 m^3/kg/day for human adults[3], 0.96 m^3/kg/day for rats, 0.54 m^3/kg/day for rabbits, 0.45 m^3/kg/day for guinea pigs, 0.39 m^3/kg/day for dog, and 1.80 m^3/kg/day for mouse (Zielhuis and van der Kreek, 1979); and 0.43 m^3/kg/day for monkey based on body weight of 3.5 kg, if actual body weight was not given in the study (U.S. EPA, 1988).

2. Human equivalent NOEL calculation for acute exposure based on a NOEL of 40 ppm (developmental toxicity study in rabbits; Breslin *et al.*, 1990) for adults:

$$40\ \ ppm \times \frac{0.54\ \ m^3/kg-day}{0.26\ \ m^3/kg-day} \times \frac{6\ \ hours}{24\ \ hours}\ =\ 21\ \ ppm$$

3. Human equivalent NOEL calculation for short-term (1-week) exposure based on a NOEL of 20 ppm (neurotoxicity in rabbits; Sikov *et al.*, 1981) for children:

$$20\ \ ppm \times \frac{0.54\ \ m^3/kg-day}{0.46\ \ m^3/kg-day} \times \frac{7\ \ hours}{24\ \ hours}\ =\ 7\ \ ppm$$

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a In the draft Technical Support Document for Exposure Assessment and Stochastic Analysis, OEHHA determined mean breathing rates of 0.24±0.07 and 0.45±0.07 m^3/kg/day for adults and children, respectively (OEHHA, 1996; Marty *et al.*, 1997).

4. Human equivalent NOEL calculation for subchronic (seasonal) exposure based on an ENEL of 0.5 ppm (neurotoxicity in dogs; Newton, 1994b) for children:

$$0.5\ ppm \times \frac{0.39\ m^3/kg-day}{0.46\ m^3/kg-day} \times \frac{7\ hours}{24\ hours} \times \frac{5\ days}{7\ days} = 0.1\ ppm$$

5. Human equivalent NOEL calculation for chronic exposure based on an ENEL of 0.3 ppm (nasal epithelial hyperplasia/degeneration in rats; Reuzel et al., 1987) for children:

$$0.3\ ppm \times \frac{0.96\ m^3/kg-day}{0.46\ m^3/kg-day} \times \frac{6\ hours}{24\ hours} \times \frac{5\ days}{7\ days} = 0.1\ ppm$$

6. Margin of Exposure:

$$Margin\ of\ Exposure = \frac{Human\ equivalent\ NOEL}{Exposure\ Level}$$

7. Calculation of Reference Concentration:

$$Reference\ Concentration = \frac{Human\ equivalent\ NOEL}{100}$$

For acute exposure:

$$\frac{21\ ppm}{100} = 210\ ppb$$